MORTALITY AND MORBIDITY IN AUSTRALIA DUE TO TRANSPORT ACCIDENTS
(a report produced and published by the Australian Transport Safety Bureau, Canberra, 2004)

INTRODUCTION

The purpose of this publication is to provide a broad overview of mortality and morbidity due to transport accidents in Australia in the last three years (2000 to 2002) for which data are available. This is a first broad-brush picture. It is anticipated that later publications will explore the topic in more detail. Responsibility for the information provided rests solely with the ATSB, as it is based on analysis by the ATSB of unpublished data obtained from the Australian Bureau of Statistics (ABS) and Australian hospitals. Hospital data have been obtained with the assistance of the Department of Health in each jurisdiction and this assistance is gratefully acknowledged.

National cause of death data (mortality data) are collected in Australia by the ABS and classified in accordance with an international standard classification called the International Statistical Classification of Diseases (ICD). Australian hospitals also use ICD when compiling data on persons injured and subsequently admitted to hospital (morbidity data). This conjuncture provides a basis for consolidation of mortality and morbidity data. It also allows for international comparisons, as national statistical agencies and hospitals worldwide use ICD. The World Health Organisation's 'Mortality Database' (available from www.who.int) provides the basis for international comparison of transport-related mortality. While comparison of transport-related morbidity might be possible for some countries for certain periods, at present there is no international database of such morbidity data.

ICD provides a nationally consistent basis for looking at mortality and morbidity due to transport accidents of all kinds (road, rail, water and air) taken together. However, it is not necessarily consistent with the approach taken by the ATSB or others in looking at safety in each transport mode individually. For example, road safety statistics compiled by the ATSB are focussed on crashes on public roads, whereas ICD covers road crashes both on and off public roads. Aviation statistics compiled by the ATSB do not cover hang-gliders, gliders and other forms of non-powered aircraft, whereas ICD does. For national road deaths, therefore, readers should refer to the 'road safety / statistics' part of the ATSB web site at www.atsb.gov.au, where road death statistics are published on a monthly basis. Similarly, for details on marine, rail and air safety (aviation death statistics are published monthly), the relevant part of the ATSB web site should be consulted. The purpose here is to provide a general overview rather than to focus on each mode in detail.

Other publications by the ATSB on related topics include:

- *Transport accident fatalities: Australia compared with other OECD countries, 1980-1999*
- *Cross-modal safety comparisons*

TRANSPORT ACCIDENTS AS A CAUSE OF INJURY

Transport accidents are a significant cause of injury, both fatal and non-fatal. In its publication titled *Deaths from External Causes, Australia, 1998 to 2002 (3320.0)*, released in February 2004, the ABS stated (p.3) that "From 1998 to 2002 external causes of death were the leading cause of death of those aged under 55 years." (To use a simpler terminology, deaths from external causes can be considered as deaths from accidents and injury.)

In the three calendar years from 2000 to 2002, transport accidents were the second most prevalent cause of fatal injury after suicide, with nearly 2,000 deaths each year attributable to transport accidents (**Table 1**).

Table 1
Deaths in Australia due to accidents and injury, 2000-02: deaths each year by cause of death

Cause of death	Number of deaths each year (average)	Per cent of deaths each year (average)
Suicide	2,329	30.5
Transport accidents	1,932	25.3
Accidental exposure to other and unspecified factors	911	11.9
Accidental poisoning	656	8.6
Other	1,821	23.8
Total deaths due to accidents and injury	**7,648**	**100.0**

Notes: 'Deaths due to accidents and injury' are deaths due to an 'external cause'. These are deaths due to a cause such as a transport accident, other accident, violence or some other cause that is external to the human body and has caused fatal injury to it. 'Accidental exposure to other and unspecified factors' is often used to classify the cause of death of persons over 65 years of age who have suffered a fracture but the cause of the fracture is uncertain. 'Other' causes of death include falls, drowning and assault, for example, and more detail on these can be found in the ABS publication *Deaths from External Causes*. All age groups are included in this table, not just the under-55s.

In this period, there were also on average 36,000 people seriously injured in transport accidents each year. Compared with other causes of accidents and injury, transport accidents in the financial year 1999-00 (the latest year for which relevant data are available) accounted for 12 per cent of hospital separations (**Table 2**).

Table 2
External causes of hospital separations: proportions, Australia, 1999-00

Major groups	Per cent
Falls	29.2
Other unintentional injuries	26.7
Complications of medical and surgical care	16.5
Transportation	12.4
Intentional, self-harm	5.1
Intentional, inflicted by another	4.7
Poisoning, pharmaceutical	2.4
Fires / burns / scalds	1.4
Poisoning, other substances	0.8
Undetermined intent	0.7
Near drowning	0.1
All major groups	**100.0**

Note: Data extracted from Table 2.2, p.5, Y. Helps, R. Cripps and J. Harrison, *Hospital separations due to injury and poisoning, Australia, 1999-00* (AIHW, Canberra, 2002). The term 'separation' refers to an episode of care, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). Figures on the numbers of persons in each of the major groups are not available.

INJURY IN EACH OF THE DIFFERENT MODES OF TRANSPORT

In the three calendar years from 2000 to 2002, more than half of the persons fatally injured in a transport accident were in a car at the time of the accident. Another 17 per cent were pedestrians and another 12 per cent were on a motorcycle. Over a third of the persons seriously injured in a transport accident were in a car at the time of the accident. Another 22 per cent were riding a motorcycle and another 15 per cent were on a bicycle (**Table 3**).

Table 3
Persons injured due to transport accidents, Australia, 2000-02: proportion (per cent) of persons injured by the mode of transport of the person injured

Mode of transport	Per cent of fatally injured	Per cent of seriously injured
car	54.3	36.4
pedestrian	17.2	9.3
motorcycle	11.7	22.4
watercraft	2.3	1.8
aircraft	2.3	0.5
heavy transport vehicle	2.0	1.4
bicycle	1.9	14.8
pick-up truck or van	1.7	1.0
special agricultural vehicle	1.2	0.5
special all-terrain or off-road motor vehicle	0.8	1.0
animal	0.6	6.4
bus	0.3	0.8
special industrial vehicle	0.3	0.3
train	0.2	0.3
special construction vehicle	0.1	0.1
unknown	2.9	1.2
three-wheeled motor vehicle	0.0	0.3
tram	0.0	0.2
cable-car, ski chair-lift, etc	0.0	1.3
Total	**100.0**	**100.0**

Note: This table has been produced by the ATSB using unpublished data obtained from the ABS and the Health Department in each jurisdiction. ‘Mode of transport’ here means the vehicle the person was travelling in at the time of being injured in a transport accident. ‘Cable-car, ski chair-lift, etc’ is ICD code V98, ‘other specified transport accidents’, including ‘accident to, on or involving: cable-car, not on rails; ice-yacht; land-yacht; ski chair-lift; ski-lift with gondola…’.

THE MOST PREVALENT CIRCUMSTANCES

In the three calendar years from 2000 to 2002, twenty circumstances accounted for 80 per cent of all transport accident deaths, car drivers colliding with fixed or stationary objects being foremost among them (**Table 4**). Not surprisingly, most of these were road crashes. The ATSB compiles an annual statistical summary on road crashes (including data on the level of use of the different kinds of road vehicles) which is available on the ATSB web site under Road Safety / Statistics.

Table 4
Persons fatally and seriously injured due to transport accidents, Australia, 2000-02: the most prevalent circumstances

Circumstances of injury	Per cent of fatally injured	Per cent of seriously injured
Car driver injured in collision with fixed or stationary object, traffic accident	14.4	4.7
Pedestrian injured in collision with car, pick-up truck or van, traffic accident	11.1	5.6
Car driver injured in collision with car, pick-up truck or van, traffic accident	10.3	8.8
Car passenger injured in collision with fixed or stationary object, traffic accident	6.2	2.4
Car driver injured in collision with heavy transport vehicle or bus, traffic accident	5.7	0.8
Car passenger injured in collision with car, pick-up truck or van, traffic accident	5.5	5.2
Motorcycle rider injured in collision with car, pick-up truck or van, driver, traffic accident	3.7	2.8
Car driver injured in noncollision transport accident, traffic accident	3.5	2.9
Motorcycle rider injured in collision with fixed or stationary object, driver, traffic accident	2.9	0.9
Person injured in unspecified motor-vehicle accident, traffic	2.7	0.2
Car passenger injured in noncollision transport accident, traffic accident	2.6	2.0
Car passenger injured in collision with heavy transport vehicle or bus, traffic accident	2.5	0.4
Pedestrian injured in collision with heavy transport vehicle or bus, traffic accident	2.2	0.2
Pedestrian injured in collision with railway train or railway vehicle, traffic accident	1.5	0.0
Motorcycle rider injured in noncollision transport accident, driver, traffic accident	1.0	2.8
Pedestrian injured in collision with car, pick-up truck or van, nontraffic accident	0.9	0.9
Pedal cyclist injured in collision with car, pick-up truck or van, driver, traffic accident	0.9	1.3
Motorcycle rider injured in collision with heavy transport vehicle or bus, driver, traffic accident	0.8	0.1
Driver of special agricultural vehicle injured in nontraffic accident	0.8	0.2
Driver of heavy transport vehicle injured in collision with fixed or stationary object, traffic accident	0.7	0.1
Persons injured in other transport accidents	20.1	57.6
All persons injured in transport accidents in 2000-02	**100.0**	**100.0**

Note: This table has been produced by the ATSB using unpublished data obtained from the ABS and the Health Department in each jurisdiction. ‘Traffic’ means on a public road. ‘Noncollision’ accidents include circumstances such as overturning. Deaths in road crashes in which a ‘heavy transport vehicle or bus’ was involved account for on average about 20 per cent of all road crash deaths each year. Deaths where a bus was involved account for about one-tenth of these. It can therefore be concluded that over 90 per cent of the deaths in road crashes involving a ‘heavy transport vehicle or bus’ are likely to be deaths in road crashes involving a heavy truck, either an articulated truck or a heavy rigid truck.

A greater range of circumstances, thirty-eight in all, accounted for 80 per cent of all persons seriously injured in transport accidents, car drivers colliding with other cars being foremost among them (**Table 5**).

Table 5
Persons fatally and seriously injured due to transport accidents, Australia, 2000-02: the most prevalent circumstances

Circumstances of injury	Per cent of seriously injured	Per cent of fatally injured
Car driver injured in collision with car, pick-up truck or van, traffic accident	8.8	10.3
Motorcycle rider injured in noncollision transport accident, driver, nontraffic accident	5.9	0.5
Pedestrian injured in collision with car, pick-up truck or van, traffic accident	5.6	11.1
Car passenger injured in collision with car, pick-up truck or van, traffic accident	5.2	5.5
Rider or occupant injured by fall from or being thrown from animal or animal-drawn vehicle in noncollision accident	5.1	0.4
Car driver injured in collision with fixed or stationary object, traffic accident	4.7	14.4
Pedal cyclist injured in noncollision transport accident, driver, nontraffic accident	4.3	0.1
Car driver injured in noncollision transport accident, traffic accident	2.9	3.5
Motorcycle rider injured in noncollision transport accident, driver, traffic accident	2.8	1.0
Motorcycle rider [any] injured in unspecified traffic accident	2.8	0.4
Motorcycle rider injured in collision with car, pick-up truck or van, driver, traffic accident	2.8	3.7
Car passenger injured in collision with fixed or stationary object, traffic accident	2.4	6.2
Pedal cyclist [any] injured in unspecified traffic accident	2.3	0.0
Car occupant [any] injured in unspecified traffic accident	2.1	0.1
Car passenger injured in noncollision transport accident, traffic accident	2.0	2.6
Motorcycle rider [any] injured in unspecified nontraffic accident	1.4	0.0
Pedal cyclist injured in noncollision transport accident, unspecified pedal cyclist, nontraffic accident	1.4	0.0
Pedal cyclist injured in collision with car, pick-up truck or van, driver, traffic accident	1.3	0.9
Pedal cyclist injured in noncollision transport accident, driver, traffic accident	1.3	0.1
Other specified transport accidents	1.3	0.0
Motorcycle rider injured in collision with fixed or stationary object, driver, nontraffic accident	1.3	0.4
Pedal cyclist [any] injured in unspecified nontraffic accident	1.2	0.0
Animal-rider or occupant of animal-drawn vehicle injured in other and unspecified transport accidents	1.1	0.1
Car driver injured in noncollision transport accident, nontraffic accident	1.0	0.1
Car driver injured in collision with fixed or stationary object, nontraffic accident	1.0	0.1
Motorcycle rider injured in collision with fixed or stationary object, driver, traffic accident	0.9	2.9
Pedestrian injured in collision with car, pick-up truck or van, nontraffic accident	0.9	0.9
Motorcycle rider injured in noncollision transport accident, unspecified motorcycle rider, nontraffic accident	0.8	0.0
Car driver injured in collision with heavy transport vehicle or bus, traffic accident	0.8	5.7
Car passenger injured in noncollision transport accident, nontraffic accident	0.7	0.2
Driver of all-terrain or other off-road motor vehicle injured in nontraffic accident	0.7	0.5
Pedestrian injured in collision with car, pick-up truck or van, unspecified whether traffic or nontraffic accident	0.6	0.0
Motorcycle rider [any] injured in other specified transport accidents	0.5	0.0
Car occupant [any] injured in other specified transport accidents	0.5	0.1
Pedal cyclist injured in collision with car, pick-up truck or van, unspecified pedal cyclist, traffic accident	0.5	0.1
Pedestrian injured in nontraffic accident involving other and unspecified motor vehicles	0.5	0.4
Pedal cyclist injured in collision with fixed or stationary object, unspecified pedal cyclist, traffic accident	0.5	0.0
Car occupant injured in noncollision transport accident, while boarding or alighting	0.5	0.1
Persons injured in other transport accidents	19.6	27.4
All persons injured in transport accidents in 2000-02	**100.0**	**100.0**

Note: This table has been produced by the ATSB using unpublished data obtained from the ABS and the Health Department in each jurisdiction.

NOTES

The ATSB gratefully acknowledges the provision of injury data by the Department of Health in each jurisdiction and the assistance of Dr Peter O'Connor, who undertook the analysis of the data provided by the jurisdictions. The scope of this publication is restricted to information at the national level. Comments or requests for further information on this publication should be emailed to stats@atsb.gov.au.

ICD - Both the ABS and Australian hospitals use the *International Statistical Classification of Diseases and Related Health Problems*, Tenth Revision (ICD-10), published by the World Health Organization. The ABS currently uses ICD-10 and Australian hospitals use a modification of this called ICD-10-AM. Differences between the two are not significant for the purposes of this publication. The key ICD definitions relevant to transport accidents can be summarised as follows:

transport accident	Any accident involving a device designed primarily for, or being used at the time primarily for, conveying persons or goods from one place to another. Excludes accidents occurring during transportation but unrelated to the hazards associated with the means of transportation. Excludes accidents involving persons engaged in the maintenance or repair of transport equipment or vehicle not in motion, unless injured by another vehicle in motion.
aircraft	Any device for transporting passengers or goods in the air.
watercraft	Any device for transporting passengers or goods on water.
motor vehicle	Any mechanically or electrically powered device, not operated on rails, upon which any person or property may be transported or drawn upon a roadway.
railway train or **railway vehicle**	Any device with or without cars coupled to it, designed for traffic on a railway. Includes funicular railway train, monorail or other vehicle designed to run on a railway track and operated chiefly on its own right-of-way, not open to other traffic. Excludes electric cars, streetcars, trams or light rail operating on a right-of-way that forms part of the public street or highway.
road vehicle	Any device in, on, or by which any person or property may be transported on a roadway.

ICD-10 mortality data is currently available from the ABS for the years 1997 to 2002. ICD-10-AM morbidity data has been obtained from Australian hospitals for the years 2000 to 2002.

Serious injury – Serious injury is defined here as an injury which results in the person being admitted to hospital, spending at least one night in a hospital bed and subsequently recovering (ie deaths are excluded). This definition is similar to that recommended by the IRTAD Special Report

on Data Definitions (BASt, Germany, 1998), namely ‘accident victims admitted to hospital as in-patients for a minimum of 24 hours, excluding all killed’. IRTAD, or the International Road Traffic Accident Database, is maintained by the Federal Highway Research Institute (BASt) in Germany. All OECD countries, including Australia, contribute to IRTAD.

In this publication, ‘year of death’ is the year that the death occurred, not the year the death was registered. It is possible that figures for the most recent years will be revised upwards as delayed death registrations are received by the ABS. A certain percentage of deaths occurring in any given year are not registered by coroners until the following year or later. For this reason, averages over a number of years are provided, to avoid the appearance of a sudden drop in deaths in the more recent years.